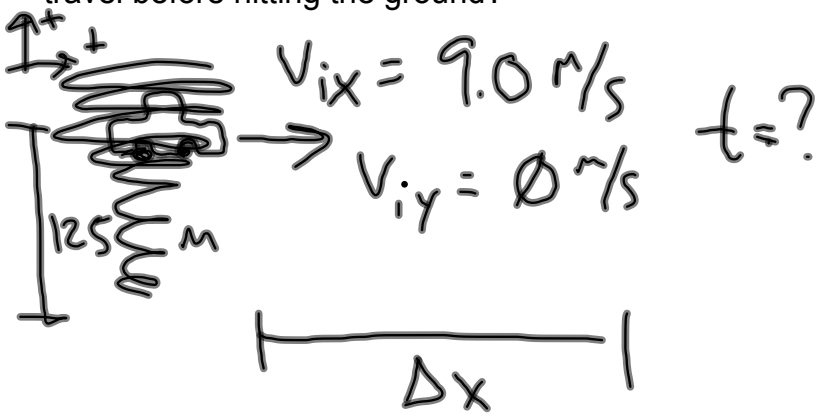
During a thunderstorm, a tornado lifts a car to a height of 125 m above the ground. Increasing in strength, the tornado flings the car horizontally with a speed of 9.0 m/s. How long does the car take to reach the ground? How far horizontally does the car travel before hitting the ground?



$$\Delta y = \cancel{V_{iy} t^0} + \frac{1}{2} a_g t^2$$

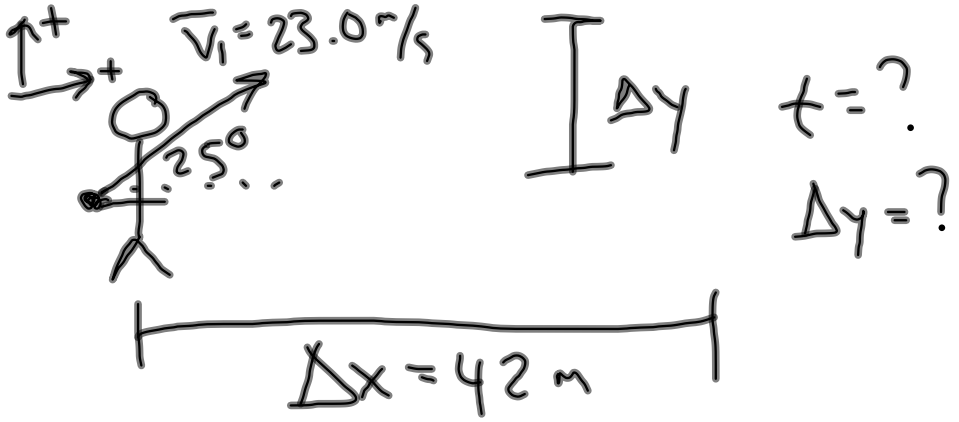
$$t = \sqrt{\frac{2\Delta y}{a_g}} = 5.05 \text{ s}$$

$$\Delta x = V_{ix} t$$

$$= 45.5 \text{ m}$$

Projectile Motion Practice Problems 4th Block 9.9.11

A baseball is thrown at an angle of 25 degrees relative to the ground at a speed of 23.0 m/s. If the ball was caught 42.0 m from the thrower at the same height it was thrown, how long was it in the air? How high above the thrower did the ball travel?



$$V_{ix} = V_i \cos(25^\circ) = 20.8 \text{ m/s}$$

$$V_{iy} = V_i \sin(25^\circ) = 9.72 \text{ m/s}$$

A) $\Delta x = V_{ix} t$

$$t = \frac{\Delta x}{V_{ix}} = 2.01 \text{ s}$$

B) $V_{fy}^{\nearrow 0} = V_{iy}^2 + 2a_g \Delta y$

$$\Delta y = -\frac{V_{iy}^2}{2a_g}$$

$$= 4.82 \text{ m}$$